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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/787,381	02/26/2004	Florian O. Mertens	GP-304820	4785

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EXAMINER	
WARTALOWICZ, PAUL A	

ART UNIT	PAPER NUMBER
1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/787,381	MERTENS ET AL.	
	Examiner	Art Unit	
	PAUL A. WARTALOWICZ	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12,14-29,48,49,54,55,57,61,63-82,84 and 88* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,14-29,48,49,54,55,57,61,63-82,84 and 88* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 2/26/09 have been fully considered but they are not persuasive.

Applicant argues that because it is patent office practice to construe claims as broadly as language reasonably permits and that accordingly, the claims are amended to read on species in which both the hydride and hydroxide comprise a lithium-containing cation.

However, it appears that the election/restriction requirement set forth the species that elected as follows:

the first hydride: lithium hydride, sodium hydride, potassium hydride, beryllium hydride, magnesium hydride, calcium hydride, strontium hydride, titanium hydride, aluminum hydride, boron hydride, lithium borohydride, sodium borohydride, magnesium borohydride, calcium borohydride, lithium alanate, sodium alanate, magnesium alanate, calcium alanate;

the second hydroxide: lithium hydroxide, sodium hydroxide, potassium hydroxide, beryllium hydroxide, magnesium hydroxide, calcium hydroxide, strontium hydroxide, titanium hydroxide, aluminum hydroxide, boron hydroxide.

Consequently, the lithium containing species would be limited to lithium hydride, lithium borohydride, lithium alanate, lithium hydroxide, and lithium hydrated hydroxides; not the broad recitation of all lithium containing cations.

It is unclear whether applicant has support for all lithium containing cations.

Additionally, it appears that Machin et al. teach the limitations of claims 1 and 72, inter alia. Previously, the claims have required "a chemically equivalent quantity" of water and hydride. However, the claim does not require this limitation at present.

Applicant argues that paragraphs 0105-0111 lend support to the limitation of "the portion of hydride particles participating in the first reaction being in contact with the other portioin of hydride particles and the hydroxide particles…".

However, it appears that the embodiment disclosed in paragraphs 0105-0110 (it appears that applicant is referencing the PG Pub, as the specification filed does not have that many paragraphs) only requires water and hydride present initially and that the reaction between water and hydride produce heat **and** the hydroxide to be reacted with the remaining hydride. See paragraphs 0109 and 0110.

Additionally, it appears that applicant is arguing that LiOH is removed from LiOH at argument mailed 12/12/08.

However, (without reference to the page number), it appears that applicant is referring to page 2206, specifically the recitation in the first full paragraph under Materials. However, this recitation teaches removing LiOH impurities by reacting the LiOH with LiH producing Li_2O and H_2. On page 2207, last paragraph, Machin describes that several "runs" take place where the presence of solid products (Li2O and LiOH) formed in varying quantities **from previous additions of water to hydride**. (Emphasis added). Therefore, it appears that Machin et al. does teach wherein LiH, Li2O, and LiOH are present initially, at least in subsequent runs, as in claims 67-71.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-88 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1 and 72 recite at line 5 and line 6 respectively "the hydride comprising a lithium-containing cation and the hydroxide comprising a lithium-containing cation."

However, it appears that there is support for to lithium hydride, lithium borohydride, lithium alanate, lithium hydroxide, and lithium hydrated hydroxides; not the broad recitation of all lithium containing cations. Applicant is requested to point to the recitation in the specification that lends support to this limitation in claims 1 and 72.

The recitation in claim 67, lines 7-10 of "the portion of hydride particles participating in the first reaction being in contact with the other portion of hydride particles…and the hydroxide comprising a lithium-containing cation."

However, it appears that the embodiment disclosed in paragraphs 0105-0110 (it appears that applicant is referencing the PG Pub, as the specification filed does not have that many paragraphs) only requires water and hydride present initially and that

the reaction between water and hydride produce heat **and** the hydroxide to be reacted with the remaining hydride. See paragraphs 0109 and 0110.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 57 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The recitation in claim 57, line 2 of "said hydroxide comprises $LiOH{\cdot}H_2O$" renders claim 57 indefinite. It is unclear whether the $LiOH{\cdot}H_2O$ is the water source or the hydroxide source or both. Clarification is requested.

Claim Objections

Claims 6, 71 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. It appears that the only second reactions referred to in the specification include a Na^+ cation. However, the species elected requires both the hydride and hydroxide to have a Li^+ containing cation limited to the species: lithium hydride, lithium borohydride, lithium alanate, lithium hydroxide, lithium hydrated hyroxides.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-12, 14-29, 54-55, 57, 63-64, 67-82, 84 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Machin et al. ("Kinetics of the Reaction of Water Vapour with Crystalline Lithium Hydride").

Machin et al. teach a method for producing hydrogen (page 2205) wherein lithium hydroxide hydrate is reacted with lithium hydride in particle form (page 2206) in the presence of water to produce hydrogen (page 2217).

It appears that Machin et al. teach water, lithium hydroxide, and lithium hydride are present in quantities such that the reaction of the reactions would be inherently taught including production of heat by the reaction of lithium hydride and water.

If these reactions are not inherently taught, it would be obvious to one of ordinary skill in the art at the time applicant's invention was made to provide mixing water, lithium hydroxide, and lithium hydride in amounts sufficient to produce hydrogen.

Additionally, it appears that Machin et al. teach that LiH reacts with both LiOH and $LiOH \cdot H_2O$ (page 2216, 2217) such that claims 20, 21, 57, 61, 64-66, 74-76, 84 are taught by Machin.

Additionally, it appears that the embodiment disclosed in paragraphs 0105-0110 (it appears that applicant is referencing the PG Pub, as the specification filed does not have that many paragraphs) only requires water and hydride present initially and that the reaction between water and hydride produce heat **and** the hydroxide to be reacted with the remaining hydride. See paragraphs 0109 and 0110.

Claims 48, 49, 61, 65, 66, and 88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Machin et al. ("Kinetics of the Reaction of Water Vapour with Crystalline Lithium Hydride") in view of Amendola et al. (U.S. 2004/0033194).

Machin teaches a process as taught above in claim 1.

Machin fails to teach lithium borohydride as the hydride used in the hydrogen generating process.

Amendola et al., however, teach a method for hydrogen generation [0024] comprising lithium borohydride [0030] for the purpose of providing useful hydrogen generation systems [0026].

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide lithium borohydride [0030] in Machin in order to provide useful hydrogen generation systems [0026] as taught by Amendola et al.

Regarding claims 65, 65, and 88, it appears that Machin et al. teach that LiH reacts with both LiOH and $LiOH \cdot H_2O$.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL A. WARTALOWICZ whose telephone number is (571)272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Paul Wartalowicz
May 8, 2009

/Stanley Silverman/
Supervisory Patent Examiner, AU 1793